Guide to Financing EnergySmart Schools

U.S. DEPARTMENT OF ENERGY

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Introduction

High-Performance School: A school facility that improves the student learning environment and achieves the maximum level of energy performance possible, saving energy, resources, and money.

By making a commitment *to high-performance schools, many school districts are discovering that smart energy choices can have lasting benefits for their students, their communities, and the environment. An energy-efficient school district with 4,000 students could save as much as $160,000 a year in energy costs. Over 10 years, those savings can reach $1.6 million, translating into the ability to hire more teachers, purchase more textbooks and computers, or invest in additional high-performance facilities. Beyond these bottom-line benefits, schools also can realize better overall student health and decreased absenteeism, and can better serve as centers of community life.*

This guide is available at www.energysmartschools.gov. Over time, the Web site will feature additional resources, illustrative case studies, and updates.

This guide addresses common barriers associated with new construction, major renovations, and retrofit projects in high-performance schools. It summarizes existing methods of financing and looks ahead to innovative, replicable approaches. This guide supports making a business case for high-performance design backed by economic analysis that looks at the costs and benefits of new construction and retrofits over the project's lifetime. It also describes non-energy benefits that tie energy efficiency and economic feasibility back to the critical mission–ensuring a healthy learning environment for students.

DOE's EnergySmart Schools Program

K–12 schools spend more than $8 billion on energy annually, making energy the second-highest operating expenditure for schools after personnel costs. Recognizing this, the U.S. Department of Energy sponsors the EnergySmart Schools Program, which encourages the building of new schools that exceed code (ASHRAE 90.1-1999) by 50 percent or more. It also promotes a 30 percent improvement in existing schools. The program offers tools and resources to assist school decision makers in planning and financing energy-efficient high-performance schools as well as education and training for building industry professionals.

School Construction Outlook

New Construction/Major Renovation

- Primarily suburban school districts and states with growing populations
- *Market outlook:* Trend toward high-performance building; however, a need for increased focus on energy efficiency still exists
- *Strategic financing opportunity:* Targeted approaches and resources that support integrated high-performance design at project onset, optimizing school performance potential

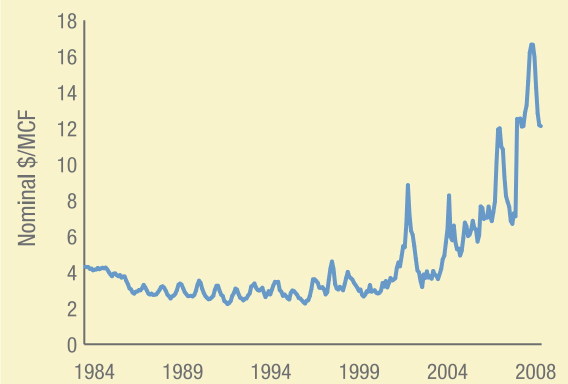
Existing Buildings/Retrofits and Upgrades

- Primarily urban and rural school districts with few major new construction plans and limited resources
- *Market outlook:* Increased number of district consolidations due to declining population growth, resulting in the need to upgrade aging infrastructure
- *Strategic financing opportunity:* Targeted approaches and resources that are tailored to the specific needs of school districts and offered at the state or local level

Energy and School Construction Outlook

According to the U.S. Energy Information Administration (EIA), average natural gas prices have climbed significantly during the past five years. Prices are projected to remain near current peaks or continue to climb. Since energy is the second-largest expense for schools, energy price increases and volatility cause unpredictable budget fluctuations that schools struggle to manage. Rising costs of natural gas and other forms of energy make high-performance school options progressively more appealing for all school districts.

Natural Gas Prices (1984 2008)



As energy prices and expenditures per pupil climb, school construction costs are also reaching national highs. In 1995, a new high school cost $12,500 per student, bringing the median cost of a high school for 1,000 students to $12.5 million. Today, a high school costs $29,289 per student. Therefore, that same high school would cost $29 million if built today.*

School construction completed in 2007–which includes new buildings and major retrofits–totaled almost $20.8 billion. In 2007, more than 63 percent of construction dollars went to new buildings. Within the existing building sector, 2007 was the first year since 1983 in which the amount of money spent on retrofitting buildings exceeded the dollars put toward additions.

While there is rapid growth in school construction and a trend toward high-performance school design, the industry lacks a focus on energy efficiency. Combining energy-efficient, integrated design principles with optimal operations and maintenance strategies can maximize returns on high-performance school investments.

Comparing Cost Savings

School A uses 100,000 kWh per year at 8 cents per kWh; it will pay $8,000 per year in utility costs. If School B uses the same amount of energy, but at 9.8 cents per kWh, it will pay $9,800 per year. This is a significant annual difference, especially if extended over the lifetime of School B.

If each school reduces its usage from 100,000 kWh to 80,000 kWh per year, School A's energy costs would fall to $6,400, while School B's costs would fall to $7,840.

These calculations imply energy cost savings of $1,600 per year for School A compared to savings of $1,960 for School B. Considering that most schools use far more energy than 100,000 kWh per year, the annual savings for School B, at the higher energy prices, stand to be significantly larger for reductions in energy usage.

Key Lesson: *High-performance schools generate higher savings as energy prices increase.*

Meeting the Challenges of High-Performance School Financing

Even if the short-term savings and long-term economic benefits of energy-efficiency improvements are obvious, up-front capital for high-performance projects is often hard to find and must be balanced against competing capital needs. While there are innovative financing approaches that lower up-front costs to the school, these mechanisms can be complicated and usually involve third parties. School administrators also face challenges in getting approval from local voters to spend tax dollars on the investment.

This guide addresses the challenges facing school administrators, facility managers, and other decision makers who are considering investments in energy-efficiency projects. While not all financing options presented will be available in every region or state, they represent a cross-section of what is available in the market. Regional considerations, such as climate and demographics, will also make some financing options better choices than others.

**Construction figures are from* The 2008 Annual School Construction Report, *at www.peterli.com/spm/pdfs/const_report_2008.pdf.*

- **Chapter 1, Principles of Financing High-Performance Schools,** describes six investment principles that are essential to understand when designing the financing of high-performance school projects. It also introduces four metrics for evaluating the viability of capital investments.
- **Chapter 2, Making a Business Case for High-Performance Schools,** focuses on building a comprehensive business case for investing in high-performance schools and offers tips on effectively selling energy-efficiency projects to school management and other decision makers.
- **Chapters 3 through 6** describe four financing options–**Internal Financing, Debt Financing, Leasing Arrangements, and Energy Savings Performance Contracts**–and the relevant state, federal, and nonprofit resources that may be available to schools that are considering incorporating energy-efficient, high-performance design into a project.
- The **Appendices** provide a primer on the economic metrics covered in Chapter 1 and a list of information resources.

Although there is no one perfect way to obtain financing, the strategies described in this guide can help schools make creative financing decisions.

Chapter 1. Principles of Financing High-Performance Schools

***School districts can realize maximum returns** on their high-performance investments by using the six principles described in this chapter. These principles apply to investments in new construction and major renovation projects, building retrofits, exterior lighting upgrades, cogeneration plants, renewable energy technologies, and district heating and cooling systems.*

Principle 1. Determine Project Objectives

Projects with comprehensive objectives increase the range of financing possibilities and allow for greater short- and long-term benefits and a broader focus when considering future needs and goals. The more carefully a school translates its needs into project objectives, the more likely it is to structure an investment well.

In addition to the bottom-line objective of energy cost savings, broad-based objectives may include:

- **Enhanced core business focus.** Energy-efficiency improvements can include the outsourcing of ongoing services for operations, maintenance, and even the payment of utility bills. Such services can free personnel to focus on core activities of the school.
- **Improved comfort and/or functionality.** When performance and reliability standards for HVAC, for example, are met and exceeded, operating costs will fall, and teacher and student comfort (and, by extension, performance) will rise.
- **Modernized infrastructure.** If properly allocated, cost savings can support capital investments and substantially decrease the total cost of modernizing a building's energy infrastructure and controls.
- **Assured environmental compliance.** Environmental quality affects the productivity of staff and students as well as the value of the building. Environmental compliance can include measures to convert cooling systems to CFC-free equipment or properly dispose of luminaires and other potentially toxic materials.

In the last 20 years, capital and technical support for high-performance schools have become more readily available, enabling increasing numbers of school districts to realize such broad-based benefits.

Along with determining the project's objectives, the school must clearly define its investment criteria, enabling project designers and managers to make fiscally sound investment decisions.

Principle 2. Avoid Cream Skimming

"Cream skimming" is the undesirable yet common practice of investing in simple projects with relatively low initial costs (relative to school size and budget parameters) and quick paybacks. While such investments are financially attractive in the short term, pursuing them may prevent a building owner from capturing more significant long-term benefits that are likely to result from more extensive and capital-intensive retrofits. By emphasizing short-term paybacks, cream skimming weakens an organization's ability to finance more capital-intensive improvements that leverage the value of those short-term paybacks.

Consider two energy-efficiency project options: a non-comprehensive (lighting only) retrofit project and a comprehensive retrofit project that contains a mix of large and small energy-efficiency measures. The non-comprehensive project has an initial capital cost of $100,000, which is paid off after two-and-a-half years. The comprehensive project has an initial capital cost of $400,000, which is paid off after four years. The figure, *Two Project Options*, on page 5 illustrates the amount of energy cost savings attained by each project over its useful life (20 years in each case).

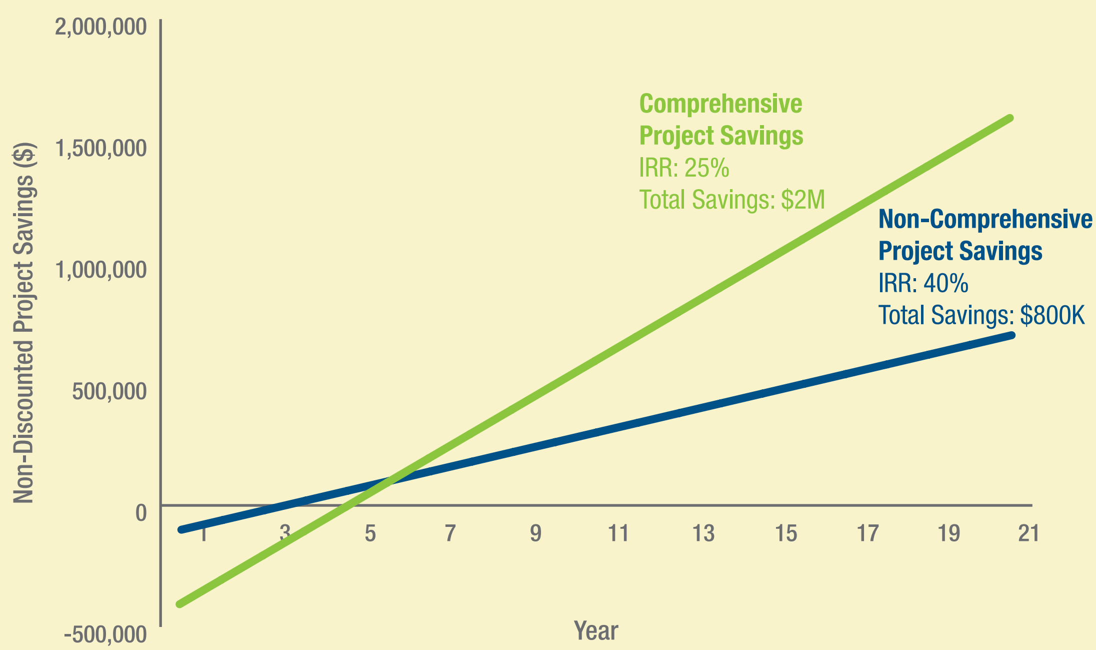
The comprehensive project's savings make it well worth the higher initial investment. Cumulative savings from the comprehensive retrofit are significantly higher than those from the non-comprehensive project during the second half of these projects' lives and will provide twice the energy cost savings of the lighting retrofit. This is a prime example of a comprehensive approach trumping a shorter-sighted cream-skimming option over time.

Key Investment Criteria

Investment criteria should be defined at the project outset and may include the following:

- **Reducing capital and operating costs.** Reducing operating costs, maximizing the return on capital investments, avoiding energy cost increases, and decreasing capital costs for infrastructure modernization may all be criteria for an energy-efficiency project.
  For example, "Targets include a 30 percent reduction in energy use as well as reduced capital investment for the chiller replacement."
- **Exceeding the organization's hurdle rate.** Investment targets may be stated in terms of the minimum internal rate of return.
  For example, "The target is a 20 percent annualized internal rate of return for all comprehensive energy-efficiency investments."
- **Maintaining positive cash flow.** Investments may be treated as a total package that must achieve neutral or positive cash flow. Cash flow can be compared to non-energy-efficiency investment costs within a given time frame.
  For example, "Positive cash flow, including financing costs, utility bills, and maintenance services, must be achieved within two years of completing energy-efficiency improvements."
- **Financing either on or off the balance sheet.** Investments may be financed on or off an organization's balance sheet. This decision will be based on internal capital availability, debt limits, and other factors.
  For example, "All project costs above $xx will be financed off the balance sheet through lease, lease-purchase, or performance contracting arrangements."

Two Project Options



Principle 3. Identify All Cash Flows

Cash flow scenarios that identify all costs and savings over the life of a project are crucial elements of any financial analysis. The life of an energy-efficiency project is determined by taking into account the term for any project financing and identifying how long resultant benefits will accrue to the end user, while also considering the life span of all other costs and savings associated with a new energy product or system.

Accurate cost projections must include the full range of costs accruing to the project throughout its useful life, typically associated with these major elements:

Planning and management

- Project management costs
- Consulting fees
- Design and engineering costs
- Cost of monitoring and verifying results

Capital acquisition and financing

- Material and procurement costs
- Financing costs
- Inflation and utility factors
- Tax implications

Installation and commissioning

- Installation labor costs
- Bulking tune-ups
- Revised load projections
- Commissioning

Operations and maintenance

- Fuel and power costs
- Maintenance costs and supplies
- Cost of replacement, disposal, or salvage
- Staff training costs

Substantial expertise and sound professional judgment are necessary to estimate several of the cash flow components, including inflation and utility factors, tax implications, and future fuel and power costs. Financial advisors and accountants should be able to provide the majority of these services as well as expertise in deciding the discount rate to be applied to any cost-benefit analysis of the cash flow.

Up-front capital investments will almost always create a short-term negative cash flow. Subsequent savings in energy use and operations and maintenance costs eventually result in a neutral or positive cash flow. A primary goal of any energy-efficiency investment should be to create positive cash flow as quickly as possible. Project planners should examine all cash flows to develop a scenario in which cash flows quickly turn positive and eventually exceed the costs of the principal payback and debt service requirements.

Financing arrangements that pay back capital costs over time or use leasing or third-party arrangements through energy service companies (ESCos), often can be structured to minimize or even eliminate the initial period of negative cash flow. However, cumulative savings realized by the school district under these arrangements are lower than those provided by internally financed projects.

Principle 4. Focus on Life-Cycle Cost Analysis

Life-cycle costs (LCCs) should be used when measuring alternate approaches (including no-action alternatives) for high-performance buildings. LCCs include all costs of acquiring, installing, owning, operating, and disposing of a building, facility, or piece of equipment. Life-cycle costing integrates all positive and negative cash flows accruing to a project over its useful life. It can be applied to energy-efficiency projects in vehicles, office equipment, or even whole buildings and should be used any time a capital improvement involves both fixed and variable costs. An example of a fixed capital cost is equipment acquisition; variable costs include monthly fuel bills and ongoing operations and maintenance costs.

The value of broad-based benefits outweighs the value of energy savings alone, and project managers should include them in the cost-benefit analyses. For example, project managers can calculate cost savings associated with optimizing operations based on reduced energy usage from less operating time and lower water usage rates. They can estimate increased building value due to improved infrastructure and environmental quality based on current market rates for various building types. They can calculate benefits by identifying key drivers of each that will change in moving from the baseline scenario (the status quo) to the new, more energy-efficient scenario, and then quantifying differences and converting them to a monetary value to the school over the life of the investment.

Principle 5. Select an Effective Cost-Benefit Method

The major function of investment analysis is to determine which projects have greater benefits than costs. The cost-benefit methods for evaluating project alternatives can range from simple to sophisticated. Four primary cost-benefit metrics–simple payback analysis, return on investment (ROI), internal rate of return (IRR), and net present value (NPV)–can be used separately or together in evaluating options. A summary of each method is shown below, and more detailed descriptions are provided in Appendix A.

Principle 6. Monitor and Verify Results

The performance of efficiency measures and the resulting savings must be quantified through sound measurement and verification methods defined for the project. When a third party constructs, finances, or installs a project and especially when an energy services agreement includes performance guarantees, the contractor and the school district must agree on specific protocols. These protocols must set a baseline before any improvements are made, estimate post-improvement targets for energy use and costs, and address any contingencies that may influence performance during the life of the project.

Total energy savings is equal to the difference between baseline and post-improvement usage costs. School personnel or an independent contractor must monitor performance after construction or installation to ensure that savings and benefits persist and to make appropriate adjustments to accommodate variations in weather or changes in building use, occupancy, or operating schedule.

The U.S. Department of Energy has spearheaded a collaborative effort with the energy services industry, financial institutions, and others during the past two years to reach consensus on measurement protocols. This effort has resulted in the International Performance Measurement and Verification Protocol (IPMVP), which provides specific guidance to building owners, state and local governments, ESCos, and financiers on how to quantify performance and energy savings from investments in energy conservation measures. It provides guidance for negotiating contract terms that will ensure a project achieves or exceeds its cost- and energy-savings goals. Planners of any building improvement project should become familiar with and use the IPMVP.

Summary of Cost-Benefit Methods

Metric Type	Definition	Pros	Cons	Use For
Simple Payback	Number of years until initial investment is covered by cost savings	Relatively simple to calculate; easily understood by decision makers	Does not account for the time value of money; disregards all savings after date of payback	Marketing purposes (non-financial audiences)
Return on Investment	Overall percent earnings on initial investment	Relatively simple to calculate; easily understood by decision makers; accounts for all life-cycle project returns	Does not account for the time value of money; does not account for relative profitability of competing projects	Marketing purposes (non-financial audiences)
Internal Rate of Return ("Hurdle Rate")	Discount rate at which discounted future cash flows equal initial investment	Accounts for time value of money; easily comparable to target rate of return	Does not account for the relative profitability of competing projects; slightly more difficult to explain to non-financial audiences	Internal decision making (can match to internal investment return requirements); not useful for comparing alternative investments side by side
Net Present Value	Sum of the discounted net cash flows of an investment over its life cycle at an average discount rate	Accounts for the time value of money over project life cycle; generates a single number that allows comparison of multiple options	More complicated to use than simple payback and ROI; more difficult for non-financial audiences to understand	Evaluating multiple investment options against one another (recommended method); should be conducted for all investment decisions

General information about the IPMVP, the full protocol, and updates can be downloaded at http://www1.eere.energy.gov/buildings/commissioning_international.html. This site offers practical guidance on measuring and verifying energy- and water-efficiency projects, and maintains complete and current information on measuring the benefits from energy conservation measures.

During new construction, building modeling tools such as **DOE's EnergyPlus** software can help evaluate and simulate technology options and potential energy impacts. More information is available at http://www.energyplus.gov. Additional DOE software tools are available at http://www.eere.energy.gov/buildings/tools_directory.

The Advanced Energy Design Guide for K-12 School Buildings was designed to help schools achieve 30 percent energy savings above ASHRAE 90.1-1991 without modeling. It is accepted by the U.S. Green Building Council as a prescriptive path to achieving Energy and Atmosphere points in the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™. This guide is available at http://www.ashrae.org/publications/page/1604.

Building Modeling

Building modeling is a valuable diagnostic tool for evaluating design decisions before construction and operational issues after construction. Modeling:

- Allows a school to confirm that the design meets the energy goal
- Gives examples and projections the school can use to help make the case for high-performance construction
- Simulates building operations and provides annual energy-use data that make evaluating energy-saving tradeoffs quicker and more accurate
- Allows comparison of actual data to theoretical design (post-construction) to help determine if the building is working as designed

Note: Building models are simulations that represent a simplified world and should be operated by members of the design team with appropriate experience and tools. Variations in building use, occupants' habits, and weather may result in a difference between the actual data and the model's projections.

Chapter 2. Making a Business Case for High-Performance Schools

***Decision makers** often are not aware of the true costs and benefits of energy-efficiency investments. A strong business case backed by well-established methodology is most likely to win key stakeholders' support for an investment. For this reason, this guide encourages using life-cycle costing and net present value calculations in the analysis of financial viability for all potential investments.*

Life-Cycle Costing (LCC) Methodology

The LCC method enables the comparison of multiple investment options across a set time period, even if the options involve varying cost patterns. For example, many highly efficient equipment choices might have higher up-front costs than a "standard efficiency" investment but result in a longer expected life and reduced energy costs over the length of the investment. The LCC method accounts for these reduced costs when comparing these options. Using LCC analysis is important when costing out both new construction and energy-efficiency upgrades.

HOW TO: LCC Analysis

1. **Identify project alternatives.** Appropriate alternatives include projects that are all designed to fill a common need. For energy improvements, this might be projects designed to address a particular end use (for example, HVAC system or lighting) or new construction projects.
2. **Identify the baseline.** For many refurbishment projects this will be the "do-nothing" alternative, such as continuing to repair the existing system. For new construction projects, it is often the minimum standards of the local energy code. Sometimes a separate baseline is used for utility company rebate calculation and overall project economic evaluation.
3. **Determine activity timing.** The time frame usually is equal to the equipment life for each option (or the expected life for new building components). This step includes establishing the start of the project (base date) and the timing for when costs, such as project management, design, construction, energy use, maintenance, equipment disposal, and finance costs, will occur for each alternative.
4. **Determine the study period.** If project alternatives have different useful lives, determining a relevant study period allows for equitable comparison. Appropriate adjustments can then be made based on replacement costs and residual values.
5. **Estimate costs.** The key to conducting a meaningful LCC is to identify and quantify all costs associated with each project alternative, including the initial equipment installation costs as well as those that occur throughout the life of the project. The increase in energy costs is a key component, especially if fossil fuel prices continue to increase at a rate higher than inflation.
6. **Compute life-cycle costs.** Once all cost values and the time frame for each alternative are identified, NPV calculates the discounted present value of the project cost for each alternative over the project life.
7. **Consider non-monetary benefits and costs.** Non-monetary benefits and costs are project-related effects for which there is no objective way of assigning a dollar value. For example, a quiet HVAC system or improved lighting might produce an expected but hard to quantify productivity gain. Such items do not directly affect the calculation of a project's cost-effectiveness. Nevertheless, decision makers should consider significant non-monetary effects, so the project proposal or business case should include them.
8. **Compare results across projects.** The alternative with the lowest LCC value would be the preferred project.

From BetterBricks, Guide to Optimizing Hospital Facility Investments, *www.betterbricks.com/graphics/assets/documents/FinanceGuideFinal.pdf.*

Project alternatives must be compared over the same time period. If the expected lives are different, adjustments are required. The common approach is to select a time horizon based on the needs of the investor (often in the 10- to 15-year range for energy investments) and to factor in replacement costs and residual values for the alternative with the shorter expected life. The alternative with the lowest overall cost then becomes the optimal choice.

Will Your EnergySmart Investment Pay Off?

Various software programs calculate life-cycle cost, including one from the U.S. Department of Energy's Federal Energy Management Program (FEMP). FEMP allows a school to determine, for example, whether low-e window panels are worth their initial price over the long run. Software and information resources from FEMP are available at http://www1.eere.energy.gov/femp/information/download_blcc.html.

Two ways of accurately estimating applicable costs over the life of the investment are:

- **Initial vs. future costs.** Initial costs comprise all planning, acquisition, and labor costs needed to install the system. Estimated future costs might affect the overall financial viability of the investment. This group might include costs for energy/fuel, water usage, financing, operations and maintenance (O&M), and replacement/disposal as well as the residual value of the technology at the end of its life.
- **Life-cycle phase.** This method buckets costs by the phase of the investment, generally planning/testing, acquisition and implementation, O&M, and disposal. Each phase contains both fixed costs (for example, acquisition, installation labor, and pilot R&D) and recurring costs (for example, maintenance labor, energy/fuel inputs, and additional facility space costs). Planners can then determine which phases of the investment carry the largest costs or monetary benefits to the school.

The key to both approaches is to identify the full range of costs for each alternative over time and to arrive at an estimate of cash flows out (expenses related to the system) and cash flows in (energy savings) for each year over the life of the investment. Equipment vendors can be another source of expertise on the capital and operating costs of various equipment choices.

Combining Life-Cycle Cost Analysis and NPV to Make a Business Case

Because NPV presents the most accurate measurement of an investment's true worth and LCC provides the best framework for estimating the true costs over time, a strong financial case for energy-efficiency investments combines these concepts, as shown in the example on page 11.

Once all cost values and the time frame for each alternative are identified, NPV calculates the discounted present value of the project costs for each alternative over the project life. This means that the costs identified through the LCC process are aggregated and are inserted into the NPV equation as the "cash flows" in the numerator. The cash flows estimated through the LCC analysis are discounted based on the school's expected return on its comparable investments. The alternative with the highest (or least negative) NPV is the logical choice from a financial viewpoint. Non-financial considerations will help determine which alternative is in the district's overall best interest.

Although the comprehensive option in the example on page 11 has higher up-front costs, it benefits from reduced costs in fiscal years 2010–2018. These savings are presented as reduced cash flows out in future years.

Presenting the Business Case

NPV and LCC are complex and can be difficult to explain to non-financial audiences. An effective presentation includes a summary of how the financial findings were arrived at, a brief overview of LCC and NPV, and a detailed appendix outlining the financial projections.

Making a convincing business case for high-performance schools requires combining the financial analysis with a compelling story that explains:

- How the proposed option supports the educational mission and project goals
- The impacts of not building a high-performance school

A strong business case also recognizes that not all decision makers consider the same aspects important. Some are motivated strictly by cost and will need to be educated on the value of life-cycle costing. Parents might be more motivated by buildings that are healthier for students. Other members of the community might want to ensure that the school will provide a dependable shelter in the case of an emergency.

Combining Life-Cycle Cost Analysis and NPV

	Total Annual Projected Costs					
Alternative	**FY2009**	**FY2010**	**FY2011**	**FY2012**	**FY2013**	**FY2014–2028**
Non-Comprehensive	$200,000	$100,000	$100,000	$100,000	$100,000	$100,000
Comprehensive	$440,000	$40,000	$40,000	$40,000	$40,000	$40,000

Using a discount rate of 3.5% and a projected life span of 20 years, the NPV equation would look like this:

$$\text{Net Present Value}_{\text{Non-Comp.}} = \frac{200{,}000}{(1+.035)} + \frac{100{,}000}{(1+.035)^2} + \frac{100{,}000}{(1+.035)^3} + \frac{100{,}000}{(1+.035)^4} + \frac{100{,}000}{(1+.035)^5} \ldots$$

$$\text{Net Present Value}_{\text{Comp.}} = \frac{440{,}000}{(1+.035)} + \frac{40{,}000}{(1+.035)^2} + \frac{40{,}000}{(1+.035)^3} + \frac{40{,}000}{(1+.035)^4} + \frac{40{,}000}{(1+.035)^5} \ldots$$

The Non-Energy Benefits of High-Performance Schools

In addition to cost savings, some systems may offer additional non-monetary or non-energy benefits, such as improved student focus, reduced absenteeism, or improved air quality.

Because these benefits are difficult to quantify reliably, it is usually best to omit them from the LCC analysis. However, noting these benefits may add significant value to a business case for energy-efficiency improvement because they support the critical mission of making schools healthier, more productive environments for students and teachers.

Sample Messages to Include in the Business Case

- A high-performance school does not have to cost more than a conventionally built school and will cost less to operate over its life.
- Schools spend more on energy than on any other expense except personnel.
- A high-performance school can significantly lower a school's operating cost. New, highly efficient equipment can replace older systems that require significant maintenance.
- A school can control and lower energy costs without affecting the educational mission.
- Schools should serve and reflect the community's values.
- Schools are the best place to teach children about energy conservation.

Key Points About LCC and NPV

- LCC accounts for all relevant costs (and corresponding cost savings) over the useful life of the investment, presenting the most complete view possible of the analysis.
- NPV accounts for the cost of foregoing other investments, which lets the decision maker know a project's profitability compared to the average return.
- NPV, if calculated using real discount rates, can offset inflation.
- NPV can be summarized as a single number, which allows the user to compare alternatives in a straightforward manner.

Start with Small Steps

Introducing energy efficiency to a school district does not have to be as complex as installing photovoltaic solar panels. Simple technological and behavioral changes can reduce energy use by as much as 33 percent.

Consider the cost of:

- Leaving a computer on–$.01 to $.03 per hour
- Leaving a copier on 24 hours a day–up to $150 per year
- Operating each soft drink machine–up to $350 per year
- Operating a urinal–$450 per year in water, sewer, and maintenance

Chapter 3. Internal Financing

***With internal financing,** projects are paid for directly with available cash drawn from the school's current operating or capital funds. The school retains all energy cost savings and often improves project implementation time by avoiding complex contract negotiations or transaction delays.*

Internal financing is the simplest and most direct way to pay for improvements or new buildings. However, the availability of internal funds is often constrained by budget limitations and competing operating and capital investment needs. Internal operating funds most commonly finance smaller, short-term projects that have relatively low capital costs and short payback periods.

Some organizations have created **revolving investment (or loan) funds** that can leverage financing for internally financed projects. In this approach, internal money is invested in one or more energy-efficiency projects. Some or all of the savings that accrue from avoided energy costs are earmarked for repayment to the revolving fund, replenishing the initial investment. Any savings in excess of costs are profits that allow the fund to grow. These profits can then be reinvested in additional energy projects. As the energy savings compound, so do the returns to the fund and the profits that can be reinvested.

How It Works

Using internal financing normally requires that funds be approved within a school's annual operating and capital budget-setting process. Budget constraints, competition among alternative investments, and the need for high rates of return can significantly limit the number of internally financed energy-efficiency improvements. Nevertheless, internal financing should support at least part of a school's capital investment plan.

The main drawback of revolving funds is the relatively long period of time required to realize the full savings of energy upgrades. Combining internal financing with a revolving investment fund, however, can leverage capital and provide a profitable return on investment.

Advantages of Internal Financing

- Presents a simple process for the administrator
- Requires no financing costs (interest or transaction fees)
- Allows internal retention of all savings from increased energy efficiency
- Results in savings that:
  - Decrease operating expenses in future years
  - Are retained in a revolving fund for additional projects
- Allows quick implementation of viable project opportunities

Disadvantages of Internal Financing

- Constrains maximum energy and dollar savings (when only non-comprehensive projects are affordable)
- Competes with other operating and capital investment needs
- Has the highest investment hurdle rate of any financing mechanism
- Requires in-house energy audit, project design, cost estimation, and operations and maintenance skills
- Is often limited by the size of the school's budget because the school has to cover all relevant costs
- Forces the school to assume all risks associated with the energy-efficiency investment

Services and Incentives Promoting High-Performance Schools

Grants and direct funding can help to lower the overall cost of a project for a school, thus directly lowering the impact on school budgets and making internal financing a more realistic possibility in many cases.

Federal Resources

Two federal sources of grants are the U.S. Department of Homeland Security (DHS) and the U.S. Department of Agriculture (USDA).

- **DHS Grants.** As of 2001, DHS has been administering the Homeland Security Grant Program (HSGP) awards. These grants are designed to enhance the ability of states, urban areas, and territories to prepare for and respond to terrorist attacks and other disasters.

  Federal Emergency Management Agency (FEMA) grants from DHS provide capital investment funding to buildings that will be used for public service in the case of a national disaster. The program provides financial assistance for state and local governments to implement measures that will "harden" structures and infrastructure. Schools are eligible to receive funding if they serve as local shelters in the event of a disaster. Energy efficiency and renewable energy are important parts of this hardening process, improving electrical systems so that they can endure significant periods of time without being connected to a larger grid. For example, on-site generation to power the cafeteria or gymnasium can be installed. More information about the program is available at http://www.fema.gov/government/grant/index.shtm.

- **USDA Rural Development Community Facilities Programs.** Community Programs administers programs designed to develop essential community facilities for public use in rural areas. These facilities include schools, libraries, child care centers, hospitals, medical clinics, assisted living facilities, fire and rescue stations, police stations, community centers, public buildings, and transportation. Community Programs uses three flexible financial tools: the Community Facilities Guaranteed Loan Program, the Community Facilities Direct Loan Program, and the Community Facilities Grant Program. FY2007 allocations for cultural and educational facilities are shown in the table below. More information about loans, grants, and loan guarantees for rural schools is available from USDA state office representatives at http://www.rurdev.usda.gov/recd_map.html.

In addition, a useful database on federal resources is the Catalog of Federal Domestic Assistance at www.gsa.gov/cfda.

State Resources

Some states offer grants or rebates that can help to lower the cost of high-performance investments.

- **State Aid (from Clean Air Act State Implementation Plan Budgets, Lawsuit Proceeds, Energy Portfolio Standards, or System Benefit Trust Funds).** State aid is always used to directly lower the overall cost of energy-efficiency investments at no cost to the locality. This has a direct impact on the amount of money needed up-front by the school, making internal financing a more viable option. Aid is often, but not always, administered through a state energy agency. It is almost always distributed based on economic need. Coverage can reach as high as 100 percent of construction costs, depending on the applicant's needs.

  An example of state aid is the **Massachusetts Technology Collaborative (MTC) Renewable Trust**, a Massachusetts state fund that provides for the installation of solar electric (photovoltaic) systems, wind electric systems, or other clean energy technologies. A school can receive up to $350,000 in grant funding from MTC to install these technologies. (School projects must be located in an investor-owned electric utility territory.) More information is available at www.mtpc.org.

The EnergySmart Schools Web site (www.energysmartschools.gov) provides the *East End Community School Case Study* as an example of a new construction project that uses state aid grants and standard bond issues in partnership with Efficiency Maine.

Community Facilities Program FY2007 Allocations—Cultural & Educational Facilities

USDA Funding Type	Percent Allocated	FY07 Metrics
Direct Loans	11%	60 loans for $64.8 million
Guaranteed Loans	18%	13 loans for $14 million
Grants*	17%	100 grants for $3.25 million

**Grants were used mainly for equipment; funds are limited, with an average grant size of $30,000.*

More information on the specific programs offered by various foundations is available from:

The Foundation Center
1627 K Street, NW
Third Floor
Washington, DC 20006-1708
202-331-1400
http://foundationcenter.org/washington

- **Rebates on Equipment Purchases.** In addition to providing straight grant financing, many states offer post-implementation rebates for energy-efficiency investments. These rebates often come as reimbursements on the capital costs of equipment or labor. An example is the Vermont state energy agency, Efficiency Vermont, and its subcontractor, the School Energy Management Program. They offer incentives to schools to implement improvements to lighting, HVAC, and cooler systems. In addition, Efficiency Vermont helps to offset investment costs by providing rebates on the equipment itself.
- **Rebates on Energy-Efficient Designs or Certifications.** State agencies may help offset the up-front investment costs through rebates on the costs to design and commission a school. For example, the Massachusetts School Building Authority currently provides up to 2 percent reimbursement of the total project cost for school districts that have school projects certified as an MA High-Performance Green School (certified MA-Collaborative for High Performance Schools). The commissioning costs might also be absorbed. The New Hampshire High Performance School Incentive allows districts that design according to Northeast Collaborative for High Performance Schools Protocol to receive an additional reimbursement of up to 3 percent.

Additional information on rebates is available on the EnergySmart Schools Web site at http://www.eere.energy.gov/buildings/energysmartschools/howto_planning.html and in the Database of State Incentives for Renewables and Efficiency (DSIRE) at http://www.dsireusa.org.

Information also is available at state energy offices, listed at http://www.eere.energy.gov/states, and at local utility offices.

Utility Resources

A utility can provide financial benefits to service providers who implement energy-efficiency measures in their projects through ESCos. This allows the service providers to provide energy-efficiency services at rates less than those of traditional ESCos. Details on this approach are available in Chapter 6.

Not-for-Profit Grant Programs

Many philanthropic or resource-pooling associations offer grant funds that lower a school's overall cost of energy-efficiency investments, reducing the burden on the school's internal financing budgets. The number and amounts of grants available from foundations are limited, and grants are often highly competitive.

Some prominent examples of not-for-profit organizations that provide energy-efficiency grants are the Doris Duke Charitable Foundation, the Pew Charitable Trusts, the Bullitt Foundation, the Kendall Foundation, the Clinton Climate Initiative, the Bill & Melinda Gates Foundation, the Illinois Clean Energy Foundation, and the Kresge Foundation. Some of these foundations focus on education, others on environmental issues, and still others on a specific city or region. All these foundations offer either direct grant funding or funding to smaller local organizations that handle energy-efficiency-related applications.

HOW TO: Internal Financing

1. Identify any grant funding that can lower the up-front cost to the school, including energy-efficiency rebate programs.
2. Consider grant programs at federal and state levels as well as in the not-for-profit sector. Explore all three sources before committing to internal financing options.
3. When making the investment decision, keep in mind the opportunity cost of committing funds up-front to a project. Issuing debt or undertaking a lease, while potentially more expensive in the long run, will keep funds on hand to cover other important costs to the school.

Chapter 4. Debt Financing

***Debt financing** can be as simple as a loan from a bank or as complex as a bond issued and marketed to investors in the open market. Both approaches can be used to finance high-performance buildings.*

The simplest form of debt financing is **direct loans.** A borrower can usually negotiate terms for repayment of principal and interest so that savings from increased energy efficiency provide at least a break-even cash flow. Some utilities and federal and state programs can reduce a borrower's financing costs through equipment rebates, reduced-rate loans for selected improvements, or guarantees or insurance that lowers credit risk to a private lender. Public organizations rarely use direct, market-rate loans to finance energy-efficiency improvements. Likewise, private organizations more commonly use internally financed, reduced-rate loans made possible by proceeds from bonds issued by state or local governments or through leases or performance contracts.

Municipal bonds are long-term debt obligations of states, local governments, and their authorities and agencies. They are generally, but not always, exempt from federal and state taxes. They are most commonly issued to finance public buildings and schools, streets and bridges, water and wastewater treatment facilities, and other major infrastructure projects. They also may be used to finance capital investments, such as infrastructure for economic development, housing for lower-income families, and energy-efficiency improvements. Municipal bonds are essentially promissory notes that require the issuer to make scheduled interest payments at specific periods at an agreed-upon rate, and to return the principal on the date the issue matures.

Debt financing for small energy-efficiency improvements is relatively uncommon among local governments. Issuing bonds to finance large initiatives or to provide reduced rate loans for schools and local governments is a more common practice among agencies of state government.

Interest rates on borrowed principal for either one-party loans or marketable bonds are a function of the tax status and creditworthiness of the borrower, the risk of the projects being financed, and the amount being financed. When applied to energy-efficiency projects, debt financing has a number of specific characteristics:

- Projects must be of a sufficient size and transaction cost to be considered debt worthy and have a low level of risk.
- Debt can be issued to support a variety of capital projects of which energy-efficiency improvements are just one part. For example, bonds can be issued for construction of new municipal buildings and school additions, with efficiency improvements included as a part of the project.
- Debt financing requires a guarantee of repayment that is acceptable to a lender based on a combination of borrower creditworthiness, project risk, and any revenue sources or assets pledged to assure debt retirement.
- Often energy-efficiency debt financing requires investment brokers and attorneys to negotiate interest rates and repayment terms that are acceptable to both borrower and lender and attractive to potential investors.

How It Works

Debt financing typically works in one of two ways:

1. A school uses credit relationships with a financial institution that result in a loan agreement between a single lender and a borrower.
2. Debt is issued in the form of bonds; like stocks, these bonds are tradable in a secondary market.

Types of Loans

There are two general types of loans:

- **Unsecured loans**, such as lines of credit, have shorter terms (one to three years) and higher interest rates and are seldom used to finance energy-efficiency projects.
- **Secured loans** generally have longer terms and relatively lower interest rates. Banks and other private lenders may require a large down payment–up to 30 or 40 percent–and collateral. While governmental funding sources, such as the Oregon Department of Energy and the Idaho Department of Water Resources, might not require a down payment, they still require appropriate collateral or a publicly backed finance authority.

Debt financing, especially through bond issues, is administratively more complex and costly than internal financing. Ceilings imposed by corporate or municipal policy, accounting standards, or federal or state legislation may restrict debt financing.

Forms of Municipal Bonds

General obligation bonds (GO bonds) are legally backed by the full faith and credit of the issuing government. The government commits its entire asset portfolio and its general taxing powers to repay the debt obligation. Most general obligation bonds have no dedicated revenue stream to repay the debt. However, some GO bonds can be self-supporting, as is commonly the case for state-issued bonds used to provide reduced-rate loans for energy-efficiency improvements. Policy, legislation, and accepted fiscal practice impose debt-limitation ceilings, so GO bonds rarely finance energy-efficiency projects.

Revenue bonds, often called limited obligation bonds, are legally secured by a specified revenue source dedicated to debt repayment. Revenue bonds are commonly used for constructing water and wastewater treatment plants, where rates paid by customers provide revenues to retire the debt. Should the specified revenue source prove insufficient to repay the debt, the borrower is not legally obligated to appropriate other revenues for repayment of interest and principal. Because revenue bonds are not backed by the full faith and credit of the issuing government, they usually do not fall under the debt-limitation ceilings.

Capital lease revenue bonds are a form of revenue bond in which the energy savings of the investment provide the revenues for repayment. An independent third party estimates these savings and provides proof of investment return. Once verified, the revenues guarantee the bond, lowering the overall cost to the issuer.

Taxable municipal bonds, unlike most municipal bonds, are not exempt from federal and state taxes. These bonds may be issued when the primary beneficiaries are private-sector rather than government or nonprofit entities. Taxable municipal bonds are an unlikely source of capital for financing energy-efficiency upgrades within schools. They are more appropriate for investments in energy efficiency by private firms, or for the development of industrial parks and office complexes powered by super-efficient techno-logies or renewable energy.

State governments may also issue **private activity bonds (PABs),** the proceeds of which may benefit private parties. A PAB may be used for financing energy-efficiency investments, but it is more commonly used for mortgage guarantees, student loans, or redevelopment financing. States may also establish bond banks in the form of designated fund pools, which assist local governments by providing ready access to capital financing or by purchasing the debt of current local government issues. Both PABs and fund pools are subject to debt-limitation ceilings.

Advantages of Debt Financing

- Avoids reliance on scarce revenue from internal operating or capital budgets
- Repays financing costs from energy savings
- Allows debt repayment terms to be structured to attain a break-even or positive cash flow
- Retains all savings internally and incurs fewer transaction and financing costs
- Provides low-cost capital for state and local governments through tax-exempt municipal bonds
- Applies especially well to large single projects or collections of smaller projects
- Makes low-cost loans available to other organizations

Disadvantages of Debt Financing

- Presents more complex administrative issues than does internal financing
- Precludes smaller projects due to complexity and transaction costs
- Varies financing costs according to creditworthiness of borrower and project risk
- Constrains project worth by imposing debt ceilings
- Requires public referenda and approval for public-sector general obligation bonds
- Requires significant in-house financial expertise
- Incurs debt that is reflected on the issuing organization's balance sheet

See the *Foster-Glocester Regional School District Case Study* on the EnergySmart Web site (www.energysmart schools.gov) as an example of a new construction and full renovation project that used state aid, bond issues, and customized ESCo services.

Services and Incentives Promoting High-Performance Schools

Federal Resources

The U.S. Department of Education's Qualified Zone Academy Bonds (QZAB) program provides tax credits to schools implementing capital investments to help them pay down interest rate costs. An established Zone Academy (school) will qualify for this program if 35 percent or more of its student body is eligible for the free or reduced lunch program. It is an excellent program for disadvantaged schools seeking to lower their overall cost of borrowing. However, being a federal program, it goes up for reauthorization each fiscal year. Schools that want to use this program must account for the potentially short-term nature of the support before they move forward in obtaining financing. More information is available at www.ed.gov/programs/qualifiedzone/index.html.

State Resources

In addition to the expert assistance available through state energy offices, state resources include the following:

- **State bonding agencies** help schools issue bonds at discounted rates by bundling them and negotiating better bulk interest rates on the packaged loans. The Rhode Island Health and Educational Building Corporation (www.rihebc.com) allows school districts to combine resources to issue bonds at discounted rates.
- **Revolving loan funds (RLFs)** are sources of loans for capital investment projects. Generally, the fund is capitalized with dollars that do not need to be repaid. As a school repays its loan to the RLF, those funds become available for new loans to other schools.
- **Forward energy credits.** If a school is bonded through the state bonding agency, the state may reimburse the interest and some principal. The Rhode Island Health and Educational Building Corporation is an example of this approach.

Not-for-Profit Resources

Philanthropic organizations may set aside revolving loan funds in programs similar to state RLFs.

Associations founded to promote energy efficiency (and other infrastructure causes) within a certain area are another source of financing. Associations that provide this service include:

- California School Board Association, Financial Services
- Association of Bay Area Governments, Financial Services

Examples of State RLFs

- **The New York Energy $mart℠ Loan Fund Program** provides a reduction to a participating lender's interest rate for up to 10 years on loans for certain energy-efficiency improvements or renewable technologies. The rate reduction for most of the state is up to 4 percent. More information on this program is available at http://www.nyserda.org/loanfund.
- **The California Energy Commission's Energy Efficiency Financing Program** provides schools, hospitals, and local governments with low-interest loans for feasibility studies and installation of energy-saving measures. Loans of up to $3 million per project are available at an interest rate beginning at 4.1 percent.
- **The State of Rhode Island** operates a loan fund that helps schools get competitive rates.

HOW TO: Debt Financing

1. Determine the optimal weighted average cost of capital for all non-subsidized debt options. This is the baseline discount rate for NPV analysis. Subsidies or discounted loan programs that lower this number will increase the NPV.
2. Look for state bonding agency options that could provide lower interest rates or forward energy credits.
3. Determine the optimal bond/loan option for the school type. (Retain financial advisory services, if necessary.) Most public schools are best served by using municipal bonds because they have the backing of the local government and often have better credit ratings than privately issued bonds.
4. Investigate state, local, and non-governmental (NGO) revolving loan options that may offer discounted interest rates.

Chapter 5. Leasing Arrangements

***Lease and lease-purchase agreements** are contracts that allow a school (the lessee) the use of equipment for a fixed time period in return for a regular installment payment. A third party (the lessor) acquires and finances energy-efficiency equipment with little or no up-front cost to the school.*

Leases can be used to obtain the full range of energy-efficient equipment and can be used for single or multi-agency purposes. Payments can be spread over 1 to 15 years or more.

There are two broad types of leases:

- **Operating leases.** The lessor owns the equipment. At the end of the lease period, the lessee can renegotiate and extend the term of the lease, buy the equipment at its residual fair market value, or return the equipment to the lessor. Tax benefits from equipment depreciation and financing costs accrue to the lessor. Because the lessee does not have a long-term equity interest in the equipment, the lease value and payments are not considered debt liabilities. As a general rule, if the lease is designed so that the equipment and improvements leased will have significant residual value at the end of the lease period, the lease will be considered an off-balance-sheet financing instrument.
- **Capital or financing leases.** The lessee pays for the equipment or improvements in equal monthly installments over the period of the lease. Generally, payments are higher than with an operating lease, but the lessee can purchase the equipment at the end of the lease period for a nominal amount (often $1). The lessee is considered the owner of the equipment and can claim tax benefits for equipment depreciation. Unlike an operating lease, a capital lease is considered a debt when the lessee is a private individual or organization.

There are three major methods of procuring lease financing:

- In **private-placement agreements,** the lessor or another investor, such as a commercial bank or pension fund, provides capital. These leases are appropriate for smaller energy projects of $500,000 or less because interest rates on private-placement agreements are generally higher because a single investor bears the project risk.
- **Certificates of participation (COPs)** are a way of obtaining financing from multiple investors. COPs mitigate project risk to each investor but do not change the underlying risk to the lease contract. COPs are sold in the open market as securities and, therefore, require the involvement of specialists, such as underwriters, bond counsel, and others. These requirements add to financing costs, making this option less viable for small projects. However, COPs are very attractive for larger projects or energy service agreements.

How It Works

Equipment is selected by the school and then leased from a commercial leasing corporation, bank, investment broker, or equipment manufacturer. Generally, lease terms are flexible and can be designed so that energy savings will pay for at least the financing portion of the lease.

A school can negotiate individual leases for each improvement, or it can set up a master lease to authorize multiple capital equipment acquisitions over time. Master leases reduce negotiating time and transaction costs and allow the lessee to spread financing costs among a larger group of projects. A master lease may be useful to a large organization or state agency that wants to provide low-cost financing of energy equipment for its own departments, agencies, or local governments.

- **Lease revenue bonds** are limited obligations of the lessor that are payable from and solely secured by the lessor's right to receive lease payments from the rental payments of the public lessee. Repayment comes from an identifiable stream of revenue, such as water and sewer charges incurred for a new plant.

Other Forms of Leases

A **guaranteed savings lease** may be either an operating or a capital lease in which the lessor guarantees that payments will not exceed the energy savings generated by the leased equipment. If savings are less than the amount guaranteed, the lessee pays the smaller amount (the amount saved) and receives credit for the difference.

Tax-exempt entities can obtain **municipal leases** or lease-purchases at significantly lower financing rates than private-sector borrowers because the lessor is not required to pay federal or state taxes on the lessee's interest payments. Municipal leases were developed as an alternative to internal or debt financing. A municipal lease that has the characteristics of an operating lease is not considered debt. Similarly, a municipal lease-purchase agreement that has the characteristics of a capital lease is not considered debt, and does not affect a municipality's balance sheet or available debt limits, as long as it meets the following provisions:

- **Annual appropriation.** Money must be earmarked for lease payments in the annual budget, but the government is not pledging its taxing authority to repay the lease. If appropriations are not sufficient to continue payments, the government can terminate the lease, and the lessor can reclaim leased equipment.
- **Equipment.** Most leased equipment, including lighting, HVAC systems, and roofing, is essential to an organization's operation. This essentiality provision reduces the lessor's risk because the equipment is essential to the proper functioning of the school and can only be removed with great hardship.
- **Abatement.** This provision allows the lessee to stop making lease payments if the leased asset becomes unavailable for use. For example, if building equipment is made unavailable for use by an earthquake or flood, the municipal lessor can abate (reduce) payments or stop them altogether.

Photo courtesy of Fossil Ridge High School, Fort Collins, Colorado

Third-Party Leasing/Installment Purchase Agreements

Because many schools are tax exempt, sometimes contracts include a third party that leases land or energy-efficient buildings to the school so that all parties can share depreciation tax breaks and the overall cost of the project is lowered. In certain states, non-exempt entities that voluntarily undertake energy-efficiency measures may take tax credits. Claiming these credits also reduces overall project costs to schools.

There are two structures for third-party leases, depending on the desired benefits for the school.

Scenario 1: *The school wishes to lower the up-front liability on its balance sheet so that decision makers or voters are more likely to approve the capital investment.*

1. The school signs over its land title to a not-for-profit entity created specifically for this purpose, and then leases it from them for as little as $1 a year.
2. The not-for-profit organization issues bonds to pay for construction or renovation of the school.
3. The school board appropriates funds or issues bonds over time and annually pays the funds to the not-for-profit organization, which uses the payments it receives to pay off bond obligations. This approach spreads the cost of the debt over the life of the bonds, instead of going on the school's books as an up-front lump sum (and forcing the school to receive state or voter authorization for the investment).

Scenario 2: *The school wishes to capture significant tax advantages, such as on-balance-sheet depreciation tax breaks or energy efficiency tax credits, but cannot because it is considered tax exempt.*

1. The school signs over its land title to the contractor or A&E firm building the school and then leases the land and buildings on it from them for $1 a year.
2. The contractor pays for construction or renovation of the school up-front.
3. The school board appropriates funds or issues bonds and uses the capital raised to pay the contractor for the costs of the construction or renovation.
4. The contractor claims the tax benefits on the depreciation of the equipment over time and splits the savings with the school, lowering the overall cost of the project.

Advantages of Lease Financing

- Avoids tapping internal funds or increasing debt
- Generates savings through energy-efficiency improvements, which repay financing
- Suits both small and large projects
- Has a lower tax-exempt interest rate than is usually available to public or institutional borrowers
- May allow for ownership of equipment at the end of the lease
- May be considered off-balance-sheet debt depending on the lease structure

Disadvantages of Lease Financing

- Has complex administration and higher financing costs
- Has complex tax implications for entities that are not tax exempt and no depreciation tax benefit for certain lessees
- Varies financing costs according to creditworthiness of borrower, risk and term of the project, and other factors
- Requires in-house project design and financial expertise
- Differs from state to state in terms of legality of third-party leasing options*

**Local financial advisors, state energy agencies, or ESCo representatives can provide more information concerning the legalities of various leasing options.*

Services and Incentives Promoting High-Performance Schools

Private Sector

Third-party contractors or financial consultants can assist schools in the construction of third-party lease arrangements, such as the one described in Scenario 2 on page 20.

Not-for-Profit Sector

Many not-for-profit organizations are willing to hold school property titles in order to facilitate lease agreements, such as the one described in Scenario 1 on page 20.

The *Greenville County School District Case Study* on the EnergySmart Schools Web site (www.energysmartschools.gov) is an example of a school district's partnership with a not-for-profit organization that issues bonds to pay for new school construction.

HOW TO: Leasing Arrangements

1. Retain financial, legal, or ESCo counsel to provide advice because leasing options can be complex and involve significant contractual or legal requirements.
2. Determine the tax credits or depreciation tax breaks available for third-party leasing options. Consult counsel regarding the legality of third-party leasing options up-front.
3. For a private school, determine which sort of lease matches the criteria of the project. A public school should consider a municipal lease, which does not count as debt on a government's balance sheet and, thus, does not affect a school district's capacity to borrow in the future.

Chapter 6. Energy Savings Performance Contracts

***An energy savings performance contract** (or simply, performance contract) is an agreement between a building or facility owner or occupant and a performance contractor. The contractor identifies, designs, and installs energy conservation measures (ECMs) and guarantees their performance.*

Under performance contracts, financing is often arranged by the contractor. As an option, the building owner or a third party may provide financing. Performance contracts also can incorporate utility incentives or government subsidies that may reduce the total cost of the project.

How It Works

Performance contracts are structured so that the payment for financing the ECMs is recovered from the energy cost savings those measures create. Performance contracts can be used to reduce energy use and costs in existing equipment, upgrade capital equipment, and improve the maintenance of existing facilities as well as enhance new construction design through the use of energy modeling. The performance contract agreement may specify that all cost savings be used to pay the financed amount or that the savings be split between the finance payments and the building owner or occupant.

The term of a performance contract commonly ranges from 5 to 10 years for a simple project. The term can extend to 20 years or more for larger projects. The term should not exceed the expected useful life of any of the upgraded systems. Contracts normally have buy-out provisions should the facility owner wish to terminate the agreement early.

In general, a performance contract is appropriate for projects that can (1) produce reliable, significant, and long-term energy-related cost savings and (2) capture all economically viable energy system improvements in an organization's entire stock of buildings and facilities. Because a performance contract offers continuing operations and maintenance services, it is an opportunity to capture long-term savings.

Performance contracts are essential to schools that:

- Lack necessary technical expertise
- Need to free in-house resources for other priorities
- Lack the time to supervise or manage comprehensive improvements
- Are unwilling or unable to finance the initial costs of improvements

Parties Involved in a Contract

Performance contracts in which the performance contractor directly finances improvements typically involve only the facility owner and the performance contractor. However, some financing agreements also may include independent financiers or third-party professionals responsible for monitoring and verifying project performance. Each party has roles and responsibilities:

- **Owner.** The school determines the project objectives, designs a request for proposal (RFP) for implementing the objectives, and selects a performance contractor that offers the best plan for completing the work at a reasonable cost.
- **Performance contractor.** The performance contractor helps to identify and capitalize on energy-saving opportunities and implements the ECMs and other services specified in the contract. ESCos are typical performance contractors with the resources to package ECM identification, project engineering, financing, construction, and maintenance.
- **Financier.** The financier provides capital to support the costs of the equipment and services provided. Any one or a combination of the financing options outlined in this chapter can provide this capital. Generally, one party is responsible for providing all capital for the design, installation, and commission of the proposed energy-savings measures as well as for assuring that cash flow is adequate.
- **Monitor.** The monitor (also referred to as the commissioning agent) is a technically qualified professional who is independent from both the owner and contractor. The monitor establishes a baseline against which performance improvements are assessed, defines monitoring protocols to measure and verify improvements, and may provide ongoing performance monitoring. At times, the ESCo serves in this role; however, the school should put in place a mechanism to avoid any conflict of interest.

Whether a performance contract is appropriate for a school's needs often depends on several factors:

- **Project size.** While performance contracts are generally most appropriate for larger buildings or a set of buildings, smaller projects also can benefit. If performance contracting is being considered for a large project that will address a school system's entire stock of buildings and facilities, a sound procedure is to implement smaller trial projects to test performance contracting as a financing option.
- **Multiple measures.** Multiple measures can improve all energy-using systems within a building. Performance contracts often contain measures with short-term paybacks that offset improvements with long-term paybacks. A school should consider a performance contract that includes multiple measures with a composite economic payback of up to seven years and individual measures with longer paybacks when the expected life span of the measure exceeds its cost-recovery period.
- **Stable building use.** Performance contracts generally are most appropriate for buildings that have relatively stable use and occupancy during the contract period. Major changes in building use may significantly affect energy consumption and require modifications to the originally agreed-upon baseline or the savings and performance guarantees the contract provides.

School systems considering multi-building projects might want to establish a master financing agreement with a single firm. Such an approach significantly reduces transaction time and costs for both the building owner and performance contractor.

Before a school system agrees to a performance contract, it should ensure that the result of the project will either include all desired efficiency improvements for the facility, or leave unimplemented only those efficiency opportunities the school system can fund in another manner. Once a facility has used a performance contract, implementing another one can be unrealistic for two primary reasons:

- The quickest return opportunities will have been accomplished, leaving only long-term payback upgrades that are not good candidates for performance contracts.
- Changes made after the project has been implemented can affect and may void the guarantee from the original performance contract.

While most performance contracting firms provide similar basic services, their offerings can vary significantly in scope and approach, especially when they are accommodating special needs.

Basic service features include technical analyses or energy audits of a building or facility, followed by design engineering, financing, and installation or construction management for all energy-efficiency improvements. The contractor may also train facility staff in operating the improvements and generally will maintain those improvements and monitor their performance. The contractor provides a guarantee of minimum performance, expected energy savings, or expected levels of energy efficiency.

Special service features include advanced or proprietary equipment or control technologies, regular equipment upgrades during the term of the contract, and waste management and disposal services. While some features increase or ensure the persistence of energy savings, others add value by improving the functionality of a building or advancing environmental protection mandates.

In order to compare various offers, a school should develop a preliminary definition and gross estimate of the potential ECMs, which serves as a baseline. The school should not share this baseline with the firms; instead the school should use it to assess the understanding and capabilities of the firms' service offerings. It is important that the school let its requirements drive the project, rather than base the development of the project on the capabilities of a firm.

Performance contracts can be structured to provide a variety of service options. Before negotiating service options, a school should decide how much contract flexibility it wants, how quickly the improvements are needed, and whether it requires on- or off-balance-sheet financing. A building owner should also be aware of how the selected options will affect both the quality of the initial improvements and the persistence of resulting savings. The final agreement should provide the best total value to the owner and a reasonable return to the contractor.

An energy performance contract must include a way to assess project success. The contractor and the facility owner should agree upon measurement and verification methods that quantify the performance of installed ECMs and the savings that accrue through increased efficiency.

For example, the parties to the contract first agree on a baseline for energy use, operations and maintenance costs, and any ancillary activities that have been carried out before improvements are installed. These factors must be measured again after the measures and services have been installed. Measurements should continue over time to ensure that savings and benefits persist and should be adjusted to accommodate variations in weather or changes in a building's use, occupancy, or operating schedule. Performance improvements and savings are the difference between baseline and post-installation measurements.

The International Performance Measurement and Verification Protocol outlines acceptable practices for measurement and verification of performance contracts.

Service Options

The agreement should specify service options:

- **Contract type.** While a performance contract that provides improved equipment and maintenance guarantees is recommended, a building owner may choose to procure equipment through a lease, lease-purchase, or other arrangement.
- **Scope of services.** The scope of services provided to the owner can range from comprehensive, turnkey services to individual services that provide less extensive support. Service coverage may address one or more buildings. Applications may cover only existing buildings or extend to planned renovations.
- **Guarantees.** The performance guarantee specifies a minimum level of energy efficiency, dollar amount of energy savings, or a combination of both. In most cases the performance contractor's compensation is tied to achieving guaranteed performance levels, and specific agreements provide incentives for higher levels of performance.
- **Financing.** The performance contractor may be required to provide all financing for improvements and services if capital funding is not available. For schools, public revenue sources, such as public capital or operating funds and public capital pools, may augment or provide the necessary financing. The school should assess the options, and choose the option that is most beneficial.

The Solicitation and Selection Process

To begin the process for selecting a performance contractor, a building owner should design an RFP that includes the following elements:

- **General requirements.** The main text should describe the scope of the desired services and the procurement process. Attachments should describe evaluation criteria, a schedule of the evaluation and selection process, and any special terms and conditions that the contractor must meet.
- **Contractor qualifications and approach.** The RFP should specify the information contractors must supply, such as qualifications, expertise, and experience in meeting the general requirements stated in the solicitation. The contracting firm also should be required to explain its proposed approach to design, financing, installation, and performance guarantee.
- **Building profile data.** A technical appendix should describe the physical characteristics, operations and maintenance data, energy use information, current energy-systems descriptions, and known improvement opportunities for each candidate building.

The building owner, working with an evaluation team, then reviews written responses to the solicitation and conducts oral interviews with representatives of the contracting firms that receive high rankings on their written proposals. A contractor should be selected only after completing an oral interview.

The time frame for the entire solicitation and selection process may range from several months to a year or more. Later agreements that expand an existing performance contract to additional buildings or facilities can be negotiated and approved in a much shorter time frame.

Advantages of Performance Contracting

- **Accountability.** The performance contractor is the single point of financial and technical accountability for all project measures.
- **Risk reduction.** By guaranteeing a minimum level of performance, the contractor takes away much of the risk for non-performance of the project from the building or facility owner.
- **No capital outlay.** A performance contract eliminates the need for the owner to make capital investments. All contractor outlays are considered off-balance-sheet costs to the building owner.
- **Levelized cash flow.** Generally, payments are structured to maintain a constant fee schedule funded fully or in part from the savings the owner realizes.

Disadvantages of Performance Contracting

- **Long contract term.** Performance contractors typically seek arrangements that last from 5 to 10 years, a duration that can be problematic for some local governments.
- **Higher project costs.** Costs associated with the performance guarantee and other services will typically increase the overall cost of a project by 10 percent or more over an in-house approach.
- **Comparative evaluations.** Because services, features, and guarantees may vary significantly among performance contractors, comparing their offerings may be difficult.

Services and Incentives Promoting High-Performance Schools

More information about energy service performance contracts is available from the National Association of Energy Service Companies at http://www.naesco.org. In addition, the Association of School Business Officials (ASBO) has published a fact sheet entitled *Performance Contracting in K–12 Schools*.

HOW TO: Performance Contracting

1. Look for more than the low bid. Select an ESCo with a good track record that can provide other necessary services, such as project design, installation, and maintenance. Get references.
2. Negotiate a contract that limits ESCo profits to a reasonable amount and establishes a win-win arrangement. Weigh the pros and cons of sharing savings rather than paying fees for services and other contractual arrangements.
3. Require the ESCo to take a comprehensive approach to energy conservation rather than a cream-skimming approach.
4. Ensure that the agreement prevents the ESCo from sacrificing quality for energy savings.
5. Ask the ESCo to incorporate extended product warranties and personnel training into the bid.
6. When the contract is signed, organize an in-house team to work with the ESCo to choose energy measures, prepare bid specs, qualify prospective bidders, and perform other tasks.
7. Work with the ESCo to determine the performance and applicability of new technologies.
8. Design the project and coordinate construction to minimize disruption of the building's functions.
9. Document both the energy and the non-energy benefits of the project and publicize its success to the community.

Appendix A: Basic Financial Concepts

Key Concepts

The time value of money, also known as discounted cash flow analysis, is one of the most important concepts in developing an investment strategy. The fundamental principle is that $1 in hand today is worth more than $1 that will be received in the future. For instance, $1 invested for one year at 7 percent annual interest will be worth $1.07 at the end of the year. Thus, the future value of $1 invested is $1.07, based on the 7 percent interest rate and a one-year period. By extension, the present value of the $1.07 that the investor will receive in one year is the original $1.

This concept is at the heart of present value theory, which is essential to apply to any modern investment decision. It implies that all cash flows must be accounted for, not just those earned up to the payback point, and that every investment is a tradeoff–the investor foregoes all other investments he or she could make with that money.

The discount rate is the rate of interest which is assumed foregone by investing initial dollars in a particular investment. Although this rate can be based a number of things, it is usually the average return on investment the investor receives on his or her portfolio in general.

Lighting Retrofit—Simple Payback

A commercial lighting system retrofit includes the addition of T-8 lamps, electronic ballasts, new reflectors, and occupancy sensors. The cost of designing, acquiring, and installing the new equipment is $100,000. With projected energy savings of about $40,000 per year (800,000 kWh at $0.05/kWh), the simple payback period for this energy retrofit is:

$100,000 ÷ $40,000/year = 2.5 years

Metric 1: Simple Payback

A simple payback calculation provides a rough estimate of the time needed to recover the initial investment. The total cost of a project is divided by the energy-cost savings accruing to it in the first year after it has begun. The lighting retrofit example below illustrates the non-comprehensive project presented in Chapter 1.

Simple payback analysis can be a valuable tool in marketing energy projects because people with minimal financial expertise can easily understand it. However, decision makers should rarely, if ever, use it as the basis for selecting an investment option because of the following drawbacks:

- It does not reflect savings that will accrue to the project after it reaches the payback point. If the payback periods for two projects are 2.5 years and 4 years, respectively, choosing between them based on simple payback ignores cumulative lifetime savings and encourages smaller total savings through cream skimming.
- It does not take into account the time value of money. This is a severe drawback, especially in cases in which the dollar value of a project is large or the useful life of the improvements is long. To compare the economic benefits of competing long-range upgrade projects properly requires discounting the value of future dollars relative to current dollars.

Metric 2: Simple Return on Investment (ROI)

The ROI method is a commonly used approach that is likely to be familiar to decision makers outside energy-efficiency applications. It involves a relatively straightforward calculation method:

$$\text{ROI} = \frac{\text{ANNUAL SAVINGS}}{\text{INITIAL INVESTMENT COST}}$$

If the annual energy savings is constant, then ROI is actually the inverse of simple payback.

$$\frac{\text{ANNUAL SAVINGS}}{\text{INITIAL INVESTMENT COST}} = \frac{1}{\text{SIMPLE PAYBACK}}$$

The ROI metric is quick and easy to use and understand. Generally, the ROI calculation generates a single value that allows the return of a project to be easily evaluated against the ROIs of competing alternatives.

However, the ROI method suffers from a serious drawback: It does not incorporate the time value of money. With the ROI method, energy savings achieved in future years are valued the same as energy savings today, a view that omits the importance of inflation and the opportunity cost of other possible investments.

Metric 3: Internal Rate of Return (IRR)

Like ROI, IRR evaluates the profitability of capital expenditures over their useful lives. Unlike ROI, IRR utilizes the time value of money theory to do so. IRR is defined as the discount rate at which the sum of discounted future cash flows equals the initial investment outlay, or NPV = 0:

$$\text{PRESENT VALUE}_{\text{inflows}} = \text{PRESENT VALUE}_{\text{investment costs}}$$

A special type of discount rate is the hurdle rate, or the “go” or “no go” criterion required for the approval of an investment. Most government and private sector organizations set internal hurdle rates, which are usually a function of the organization’s cost of capital and the annual returns expected from alternate investments. Often determined by the school finance officer, the hurdle rate varies among school districts and reflects the school’s financial outlook and investment strategy. Private rates generally are higher than government rates and may reach 20 percent or more.

Two Project Options

Hurdle rates allow the evaluator to compare an investment’s IRR to the organization’s desired rate of return in order to determine relative profitability. If the IRR exceeds the hurdle rate, then the project is considered a “go”; if it does not, then it is not deemed profitable enough and is a “no go.”

IRR can be difficult to calculate as the NPV equation can be highly complex. However, it can be calculated using a financial calculator or standard spreadsheet program such as Microsoft® Excel®. Plugging the numbers for the example *Two Project Options* (below) into an IRR function in Excel will yield IRRs for the non-comprehensive and comprehensive retrofit projects of 40 percent and 25 percent respectively. With these rates, both projects are likely to be attractive to typical municipal investors.

However, as the next section will show, the non-comprehensive project is not the more profitable of the two projects, despite its higher IRR. While IRR is a better evaluation method than simple payback analysis, it does not fully account for the relative profitability of competing projects, a significant factor in choosing among alternative proposals.

Metric 4: Net Present Value (NPV)

NPV is the key profitability indicator that takes into account both life-cycle cash flows and the time value of money. NPV should be used as the primary method for evaluating project-financing decisions. The higher the NPV, the greater the profitability of an investment.

NPV is calculated by adding the initial investment (always a negative cash flow) to the present value of anticipated future cash flows over the useful life of an improvement. To discount the value of future dollars to today’s dollars, NPV calculations commonly use a discount rate equivalent to the hurdle rate of the organization considering an investment. A positive NPV indicates that the investment is profitable and should be pursued. If the NPV is zero, then the economic value of the investment is neutral. A negative NPV indicates that the investment is not profitable.

The table on page 29 compares the profitability of the non-comprehensive and comprehensive projects using NPV calculations. The initial investment and annual cash flows are discounted at a rate of 3.5 percent to derive the present value for each year. The annual cash flow values are added to arrive at the NPV.

The example illustrates the effect of discounting on consecutive yearly cash flows. The discount rate reflects the hurdle rate (or desired rate of return) for the investing organization. The key to performing this type of analysis is to use a simple discounting formula:

$$1/(1+r)^n$$

r = discount rate and n = number of years

This calculation yields a discount factor. Multiplying the projected yearly cash flow by the discount factor determines the present value for that year. Discounting accounts for the time value of money by adjusting the worth of future dollars to the value of today's dollars. The sum of the discounted annual cash flows (including the original investment or outflow) yields the NPV for the investment and clearly shows the higher profitability of the more comprehensive project.

Calculating NPV

	Non-Comprehensive Project			Comprehensive Project		
Year	Cash Flow	Discount Factor (@3.5% rate)	Present Value	Cash Flow	Discount Factor (@3.5% rate)	Present Value
0	-$100,000	1.000	-$100,000	-$400,000	1.000	-$400,000
1	40,000	0.966	$38,647	100,000	0.966	$96,618
2	40,000	0.902	$36,078	100,000	0.902	$90,194
3	40,000	0.814	$32,540	100,000	0.814	$81,350
4	40,000	0.709	$28,357	100,000	0.709	$70,892
5	40,000	0.597	$23,876	100,000	0.597	$59,689
6	40,000	0.486	$19,423	100,000	0.486	$48,557
7	40,000	0.382	$15,266	100,000	0.382	$38,165
8	40,000	0.290	$11,593	100,000	0.290	$28,983
9	40,000	0.213	$8,506	100,000	0.213	$21,266
10	40,000	0.151	$6,030	100,000	0.151	$15,076
11	40,000	0.103	$4,130	100,000	0.103	$10,326
12	40,000	0.068	$2,733	100,000	0.068	$6,834
13	40,000	0.044	$1,748	100,000	0.044	$4,369
14	40,000	0.027	$1,080	100,000	0.027	$2,699
15	40,000	0.016	$644	100,000	0.016	$1,611
16	40,000	0.009	$372	100,000	0.009	$929
17	40,000	0.005	$207	100,000	0.005	$518
18	40,000	0.003	$111	100,000	0.003	$279
19	40,000	0.001	$58	100,000	0.001	$145
20	40,000	0.001	$29	100,000	0.001	$73
Total*	**$700,000**		**$131,430**	**$1,600,000**		**$178,575**

**Totals may not equal sums due to independent rounding.*

The table to the right compares the results from applying simple payback, IRR, and NPV to the two energy-efficiency projects. This comparison illustrates why an investor must carefully choose the appropriate analytic method when examining investment options. While simple payback and IRR analysis make the non-comprehensive project seem more attractive, the comprehensive project has a much higher NPV, making it the more profitable investment. Because NPV accounts for all the costs intrinsic to a given investment, it always presents a clearer picture of an investment's true value than other metrics.

NPV and Profitability

Analysis Factors	Non-Comprehensive Project	Comprehensive Project
Investment	$100,000	$400,000
Savings	$40,000/yr	$100,000/yr
Simple Payback	2.5 years	4 years
IRR	40%	25%
NPV (@3.5%)	$131,430	$178,575

Appendix B: High-Performance School Financing—Information Resources

Note: Information listed in this appendix is available and periodically updated on the EnergySmart Schools Web site at www.energysmartschools.gov.

Basic protocols used to finance energy-efficient school projects

- The California Energy Commission's *How to Finance Public Sector Energy Efficiency Projects* addresses financing for public school districts (http://www.energy.ca.gov/reports/efficiency_handbooks/400-00-001A.PDF).
- ENERGY STAR® *Money for Your Energy Upgrades: An Introduction to Financing Energy Efficiency Upgrades in the Public Sector* is available at http://www.energystar.gov/ia/business/Self_Guide_ES_Finance.pdf.
- *Massachusetts High Performance Green Schools Guidelines: Planning* is a comprehensive guide to planning and financing a high-performance school (http://www.mtpc.org/renewableenergy/green_schools/CHPSMA_vI-PLANNING-FINAL.pdf).

How to overcome operational and financial barriers

- This *Collaborative for High Performance Schools* (CHPS) presentation addresses the technical aspects of efficient construction, as suggested for the State of California (http://www.cee1.org/com/bldgs/ander.ppt).
- This presentation, *Facilities Management Perspective–Barriers to Energy Efficiency*, from Montgomery County Public Schools in Maryland, addresses how school management can oversee new construction (http://www.cee1.org/com/bldgs/gallagher.ppt).
- *Savings by Design: A Statewide Energy Efficiency Program for the Construction Industry*, a presentation by California's Pacific Gas and Electric Company about a statewide energy-efficiency program, provides design approaches and incentives (http://www.cee1.org/com/bldgs/kesting.ppt).
- *New Schools: Financial Barriers*, a presentation by the New York State Energy Research and Development Authority (NYSERDA), discusses overcoming financial barriers (http://www.cee1.org/com/bldgs/lavada2.ppt).

Studies supporting the non-energy benefits of high-performance schools

- *Greening America's Schools: Costs and Benefits*, Gregory Kats, October 2006 (http://www.cap-e.com/ewebeditpro/items/O59F9819.pdf)
- *Green Schools: Attributes for Health and Learning*, National Academies of Science (http://www.nap.edu/catalog.php?record_id=11756)
- *Daylighting in Schools–An Investigation into the Relationship between Daylighting and Human Performance*, Heschong Mahone Group, Inc., 1999, 2001 (re-analysis report) (http://www.h-m-g.com/projects/daylighting/projects-PIER.htm)

Case studies outlining various financing mechanisms

- Cali Calmecac Charter School, Windsor, California (http://www.ase.org/section/program/greenschl/spirit)
- Northeast Energy Efficiency Partnerships (NEEP)–High Performance Schools Exchange (http://www.neep.org/HPSE/case_studies.html)
- New York State Energy Research and Development Authority (NYSERDA)–New Construction Program Case Studies (http://www.nyserda.org/programs/New_Construction/casestudies.asp)
- Connecticut Clean Energy Trail (http://www.cleanenergytrail.com)
- Hastings Public School District, Hastings, Nebraska, a Johnson Controls case study, involves using an ESCo in the financing of an energy-efficient school project (http://web.archive.org/web/20060301002551/http:/www.johnsoncontrols.com/cg-cases/hastings.pdf).

Cost savings from performance-based contracts

- National Association of Energy Service Companies (NAESCO) (http://www.naesco.org)
- National Clearinghouse for Educational Facilities, Performance Contracting for School Buildings–This site provides a list of articles, books, and other publications about performance contracting (http://www.edfacilities.org/rl/performance_contracting.cfm).
- NAESCO's Reducing Operating Costs and Improving the Student Learning Environment–This case study illustrates energy-efficiency capital upgrades in K–12 schools (http://www.naesco.org/bookstore/default.aspx).

Loans, grants, rebates, incentives, and legislation

- Database of State Incentives for Renewables & Efficiency (http://www.dsireusa.org)
- DHS infrastructure hardening grants–Information on grants that support the implementation of the State Homeland Security Strategy to address the identified planning, equipment, training, and exercise needs in preparedness against acts of terrorism (http://www.dhs.gov/xgovt/grants/index.shtm)
- Federal and State Incentive Program for Green Builders–A variety of funding choices, including grants, tax credits, and loans (http://www.epa.gov/greenbuilding/tools/funding.htm)
- High Performance Schools Exchange–NEEP State Policies and Regulations for School Buildings–Resources from New England state agencies that demonstrate the current school building requirements (http://www.neep.org/HPSE/policy_regulation.html)
- Midwest Energy Efficiency Alliance (MEEA) Lights for Learning Program–Information on a school-oriented fundraiser through the sale of energy-efficient compact fluorescent lamps (CFL); schools receive 50 percent of the profit from CFL sales as well as bonuses for exemplary sales achievements (http://www.mwalliance.org/program_page.php?page=Lights for Learning Fundraiser)
- Massachusetts Technology Collaborative (MTC) Renewable Energy Trust Green Schools Initiative–Information on $15 million in grants available to fund solar electric panels, wind turbines, and other clean technologies as well as assistance in green building design and planning (http://www.masstech.org/greenschools/green_schools.htm)
- Massachusetts High Performance School Incentive–Information on how Massachusetts schools receive a 2 percent reimbursement of total project cost for school districts that have their projects MA-CHPS certified (http://www.masstech.org/greenschools/green_schools/planning.htm)
- New Hampshire High Performance School Incentive–Information on a New Hampshire law that provides 3 percent incremental reimbursements for schools that build to high-performance standards (http://www.gencourt.state.nh.us/legislation/2005/HB0129.html)
- New York System Benefits Charge (SBC)–Information on SBC funding of public initiatives that are not addressed by New York's competitive electricity markets (http://www.dps.state.ny.us/sbc.htm)
- NYSERDA Energy $martSM Loan Fund Program–Information about interest rate reductions on loans for certain energy-efficiency improvements or renewable technologies; loan fund terms and documents are effective September 1, 2007, to July 31, 2009 (http://www.nyserda.org/loanfund)
- NEEP High Performance Schools Guideline (http://www.neep.org/newsletter/1Q2007/schools.html)
- State of Rhode Island Office of Energy Resources Renewable Energy Fund and Rhode Island Solar on Schools Initiative–Programs for increasing the role of renewable energy in the state's electricity supply (http://www.energy.ri.gov/programs/renewable.php)
- Vermont Fuels for Schools (VFFS) Program–Statewide renewable energy-use initiative with the goal of providing schools with the information and support they need to evaluate and successfully implement woodchip and other biomass heating systems that replace expensive fossil fuels with locally produced wood fuels (http://www.biomasscenter.org/services/school-wood-heat.html)

Utilities and energy services

- Duke Energy Foundation–Annual grants for environmental and energy-efficiency projects (http://www.duke-energy.com/community/foundation/areas-of-focus.asp)
- Efficiency Maine–Promotes the more efficient use of electricity for Maine residents. Funded by electricity consumers and administered by the Maine Public Utilities Commission, it offers school-related incentives under its business segment (http://www.efficiencymaine.com/business_programs.htm).
- Efficiency Maine–High Performance Schools–Encourages energy efficiency in new schools (http://www.efficiencymaine.com/other_programs_hps.htm).
- Efficiency Vermont–Operated by an independent, nonprofit organization under contract to the Vermont Public Service Board. Its business segment offers school-related incentives (http://www.efficiencyvermont.com/pages/Business).
- New Hampshire Public Utilities Commission Core Energy Efficiency programs–Designed for statewide implementation and funded by the System Benefits Charge (http://www.puc.state.nh.us/Electric/coreenergyefficiencyprograms.htm).
- Puget Sound Energy Corporate Giving Program–Offers grants, rebates, and other financing options for energy-efficiency projects (http://www.pse.com/solutions/forbusiness/Pages/efficiencyComPrograms.aspx).

Finance tools

- California Energy Commission–Financing through low-interest loans (http://www.energy.ca.gov/efficiency/financing/index.html)
- NYSERDA Capital & Maintenance Planning Reports–A tool for producing comprehensive maintenance plans, five-year capital facility plans, and facility report cards; enable macros to access Excel spreadsheet (http://www.emsc.nysed.gov/facplan/forms/Comprehensive_Maintenance_Plan_052005.xls)

Renewable energy/schools materials

- New York State Solar Electric Incentive Program–Describes available incentives for new solar electric or photovoltaic (PV) installations (http://www.powernaturally.org/Programs/Solar/incentives.asp)
- New York On Site or Small Wind Cash Incentives–Explains how wind power works and describes available incentives for wind generation systems (http://www.powernaturally.org/Programs/Wind/incentives.asp)

State and regional energy-efficiency programs

- *Commercial Building Performance*, by the Consortium for Energy Efficiency (CEE), is a fact sheet that gives financial and technical reasons and resources for building an energy-efficient K–12 school (http://www.cee1.org/com/bldgs/schools-fs.pdf).
- The California Energy Commission's Energy Efficiency Financing/Bright Schools Program (http://www.energy.ca.gov/efficiency/brightschools)
- Greening Schools–This site provides a comprehensive list of funding options for energy-efficient school projects (http://www.greeningschools.org/resources/funding_opportunities.cfm).
- Massachusetts Technology Collaborative (MTC) (http://www.mtpc.org/renewableenergy/green_schools.htm)
- Massachusetts Technology Collaborative (MTC) Green Schools Publications (http://www.mtpc.org/renewableenergy/green_schools/gs_publications.html)
- Renewable Energy Vermont (http://www.revermont.org)
- Vermont Renewable Energy Resource Center (http://www.rerc-vt.org)

Resources on bonds

- Qualified Zone Academy Bonds–Information about how an established Zone Academy (school) with 35 percent or more of its student body on the free or reduced-price lunch program can qualify for reduced-interest or interest-free loans (www.ed.gov/programs/qualifiedzone/index.html)
- Rhode Island Health and Educational Building Corporation–Issues tax-exempt bonds to nonprofit institutions, including public and private primary and secondary schools (http://www.rihebc.com).

Regional energy-efficiency technology leasing programs

- Association of Bay Area Governments, Financial Services–Offers a full range of programs to public and private borrowers in the municipal capital markets (http://www.abag.ca.gov/services/finance/about/about.htm).
- California School Boards Association, Financial Services–This site provides a list of financial services available through CSBA (http://www.csba.org/Services/Services/FinancialServices.aspx).
- California State Association of Counties, Financial Services–Provides a broad array of financial services and programs (http://www.csac.counties.org/default.asp?id=23).
- League of California Cities and California State Association of Governments, California Statewide Communities Development Authority–These organizations provide various financing programs (http://www.cacities.org/index.jsp?displaytype=11&zone=locc&ion=util&sub_sec=util_prodserv&tert=&story=4116).

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